Fiscal Year:	FY 2015	**Task Last Updated:**	FY 04/27/2015
PI Name:	Vizzeri, Gianmarco M.D.		
Project Title:	Effects of Short-Term Hypercapnia During Head-Down Bed Rest on Ocular Structures and Cerebral Blood Flow in Healthy Human Subjects		
Division Name:	Human Research		
Program/Discipline:			
Program/Discipline--Element/Subdiscipline:	HUMAN RESEARCH--Biomedical countermeasures		
Joint Agency Name:		**TechPort:**	No
Human Research Program Elements:	(1) **HHC**:Human Health Countermeasures		
Human Research Program Risks:	(1) **Cardiovascular**:Risk of Cardiovascular Adaptations Contributing to Adverse Mission Performance and Health Outcomes (2) **SANS**:Risk of Spaceflight Associated Neuro-ocular Syndrome (SANS)		
Space Biology Element:	None		
Space Biology Cross-Element Discipline:	None		
Space Biology Special Category:	None		
PI Email:	givizzer@utmb.edu	**Fax:**	FY
PI Organization Type:	UNIVERSITY	**Phone:**	409-747-5426
Organization Name:	The University of Texas Medical Branch		
PI Address 1:	Ophthalmology		
PI Address 2:	700 University Blvd		
PI Web Page:			
City:	Galveston	**State:**	TX
Zip Code:	77550-5552	**Congressional District:**	14
Comments:			
Project Type:	GROUND	**Solicitation / Funding Source:**	2013 HERO NNJ13ZSA002N-Crew Health OMNIBUS
Start Date:	01/12/2015	**End Date:**	03/10/2016
No. of Post Docs:		**No. of PhD Degrees:**	
No. of PhD Candidates:		**No. of Master' Degrees:**	
No. of Master's Candidates:		**No. of Bachelor's Degrees:**	
No. of Bachelor's Candidates:		**Monitoring Center:**	NASA JSC
Contact Monitor:	Norsk, Peter	**Contact Phone:**	
Contact Email:	Peter.norsk@nasa.gov		
Flight Program:			
Flight Assignment:	NOTE: Extended to 3/10/2016 (original end date was 10/1/2015) per R. Brady/JSC HRP (Ed., 2/22/16)		
Key Personnel Changes/Previous PI:			
COI Name (Institution):	Stenger, Michael Ph.D. (Wyle Laboratories, Inc.) Zanello, Susana Ph.D. (Universities Space Research Association) Ploutz-Snyder, Robert Ph.D. (Universities Space Research Association)		
Grant/Contract No.:	T72618 (subcontract)		
Performance Goal No.:			
Performance Goal Text:			

Task Description:	This proposal applies short-term hypercapnia to a head-down bed rest (HDBR) analog to more closely replicate the conditions characterizing a space exploration environment. The purpose of the study is to evaluate ocular structural and cerebral blood flow changes in healthy human subjects exposed to such environment. Commercially available sleeping cubicle provided with carbon dioxide (CO2) injection system will be used to produce hypercapnia (1% CO2). Intraocular pressure will be measured to evaluate the changes in response to a hypercarbic environment applied to HDBR. In addition, Spectral-domain OCT scans of the retina and the optic disc will be performed and compared to baseline conditions. Cerebral blood flow responses will be assessed using transcranial Doppler (TCD) ultrasonography. Noninvasive blood pressure waveforms and electrocardiogram will be obtained and correlated with TCD and ocular measures; in addition, they will be used with TCD to indirectly estimate the intracranial pressure by employing a novel algorithm (Non-invasive IntraCranial pressure Framework, or NICF). In conclusion, it is anticipated that this study will be able to assess a priority risk in the Human Research Program Roadmap and accelerate the understanding of the pathophysiology of the Visual Impairment and Intracranial Pressure syndrome.
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	
Task Progress:	New project for FY2015.
Bibliography Type:	Description: (Last Updated: 04/24/2019)